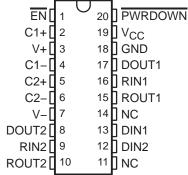
MAX3222 3-V TO 5.5-V MULTICHANNEL RS-232 LINE DRIVER/RECEIVER WITH \pm 15-kV ESD PROTECTION

SLLS408G - JANUARY 2000 - REVISED MARCH 2004

- RS-232 Bus-Pin ESD Protection Exceeds ±15 kV Using Human-Body Model (HBM)
- Meets or Exceeds the Requirements of TIA/EIA-232-F and ITU v.28 Standards
- Operates With 3-V to 5.5-V V_{CC} Supply
- Operates Up To 250 kbit/s
- Two Drivers and Two Receivers
- Low Standby Current . . . 1 μA Typical
- External Capacitors . . . 4 × 0.1 μF
- Accepts 5-V Logic Input With 3.3-V Supply
- Alternative High-Speed Pin-Compatible Device (1 Mbit/s)
 - SNx5C3222
- Applications
 - Battery-Powered Systems, PDAs, Notebooks, Laptops, Palmtop PCs, and Hand-Held Equipment

DB, DW, OR PW PACKAGE (TOP VIEW)



NC - No internal connection

description/ordering information

The MAX3222 consists of two line drivers, two line receivers, and a dual charge-pump circuit with ± 15 -kV ESD protection pin to pin (serial-port connection pins, including GND). The device meets the requirements of TIA/EIA-232-F and provides the electrical interface between an asynchronous communication controller and the serial-port connector. The charge pump and four small external capacitors allow operation from a single 3-V to 5.5-V supply. The device operates at data signaling rates up to 250 kbit/s and a maximum of 30-V/ μ s driver output slew rate.

ORDERING INFORMATION

TA	PACKAGE [†]		ORDERABLE PART NUMBER	TOP-SIDE MARKING
	COIC (DW)	Tube of 25	MAX3222CDW	MAYAAAA
	SOIC (DW)	Reel of 2000	MAX3222CDWR	MAX3222C
000 1- 7000	0000 (DD)	Tube of 70	MAX3222CDB	14400000
−0°C to 70°C	SSOP (DB)	Reel of 2000	MAX3222CDBR	MA3222C
	T0000 (DIA)	Tube of 70	MAX3222CPW	14400000
	TSSOP (PW)	Reel of 2000	MAX3222CPWR	MA3222C
	COIC (DW)	Tube of 25	MAX3222IDW	MAYAAAA
	SOIC (DW)	Reel of 2000	MAX3222IDWR	MAX3222I
4000 +- 0500	CCOD (DD)	Tube of 70	MAX3222IDB	MDaggal
-40°C to 85°C	SSOP (DB)	Reel of 2000	MAX3222IDBR	MB3222I
	TCCOD (DWA)	Tube of 70	MAX3222IPW	MDaggal
	TSSOP (PW)	Reel of 2000	MAX3222IPWR	MB3222I

[†] Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at www.ti.com/sc/package.



Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.



3-V TO 5.5-V MULTICHANNEL RS-232 LINE DRIVER/RECEIVER WITH \pm 15-kV ESD PROTECTION

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description/ordering information (continued)

The MAX3222 can be placed in the power-down mode by setting $\overline{PWRDOWN}$ low, which draws only 1 μA from the power supply. When the device is powered down, the receivers remain active while the drivers are placed in the high-impedance state. Also, during power down, the onboard charge pump is disabled; V+ is lowered to V_{CC} , and V- is raised toward GND. Receiver outputs also can be placed in the high-impedance state by setting \overline{EN} high.

Function Tables

EACH DRIVER

INI	OUTPUT	
DIN	PWRDOWN	DOUT
Х	L	Z
L	Н	Н
Н	Н	L

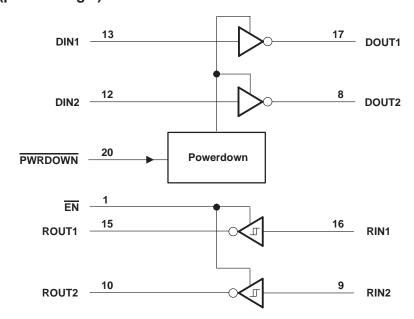
H = high level, L = low level, X = irrelevant, Z = high impedance

EACH RECEIVER

INPU	OUTPUT			
RIN	EN	ROUT		
L	L	Н		
Н	L	L		
X	Н	Z		
Open	L	Н		

H = high level, L = low level, X = irrelevant, Z = high impedance (off), Open = input disconnected or connected driver off

logic diagram (positive logic)





3-V TO 5.5-V MULTICHANNEL RS-232 LINE DRIVER/RECEIVER WITH +15-kV ESD PROTECTION

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absolute maximum ratings over operating free-air temperature range (unless otherwise noted)

Supply voltage range, V _{CC} (see Note 1)	-0.3 V to 6 V
Positive output supply voltage range, V+ (see Note 1)	
Negative output supply voltage range, V- (see Note 1)	
Supply voltage difference, V+ - V- (see Note 1)	
Input voltage range, V _I : Drivers, EN, PWRDOWN	
Receivers	
Output voltage range, V _O : Drivers	13.2 V to 13.2 V
Receivers	0.3 V to V _{CC} + 0.3 V
Package thermal impedance, θ _{JA} (see Notes 2 and 3):	: DB package
	DW package 58°C/W
	PW package 83°C/W
Operating virtual junction temperature, T _J	150°C
Storage temperature range, T _{Stq}	–65°C to 150°C

[†] Stresses beyond those listed under "absolute maximum ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

NOTES: 1. All voltages are with respect to network GND.

- 2. Maximum power dissipation is a function of T_J(max), θ_{JA}, and T_A. The maximum allowable power dissipation at any allowable ambient temperature is P_D = (T_J(max) T_A)/θ_{JA}. Operating at the absolute maximum T_J of 150°C can affect reliability.
- 3. The package thermal impedance is calculated in accordance with JESD 51-7.

recommended operating conditions (see Note 4 and Figure 5)

				MIN	NOM	MAX	UNIT
		V _{CC} = 3.3 V		3	3.3	3.6	.,
	Supply voltage	V _{CC} = 5 V		4.5	5	5.5	V
.,	Driven and control birth level in motoraltane	DIAL EN DIA/DOMAN	V _{CC} = 3.3 V	2			.,
VIH	Driver and control high-level input voltage	DIN, EN, PWRDOWN	V _{CC} = 5 V	2.4			V
VIL	Driver and control low-level input voltage	DIN, EN, PWRDOWN				0.8	V
٧ _I	Driver and control input voltage	DIN, EN, PWRDOWN		0		5.5	V
٧ _I	Receiver input voltage			-25		25	V
Τ.		MAX3222C		0		70	00
TA	Operating free-air temperature	MAX3222I	-40		85	•°C	

NOTE 4: Test conditions are C1–C4 = 0.1 μ F at V $_{CC}$ = 3.3 V \pm 0.3 V; C1 = 0.047 μ F, C2–C4 = 0.33 μ F at V $_{CC}$ = 5 V \pm 0.5 V.

electrical characteristics over recommended ranges of supply voltage and operating free-air temperature (unless otherwise noted) (see Note 4 and Figure 5)

_						
	PARAMETER	TEST CONDITIONS	MIN	TYP [‡]	MAX	UNIT
Ц	Input leakage current (EN, PWRDOWN)			±0.01	±1	μΑ
laa	Supply current	No load, PWRDOWN at VCC		0.3	1	mA
Icc	Supply current (powered off)	No load, PWRDOWN at GND		1	10	μΑ

[‡] All typical values are at $V_{CC} = 3.3 \text{ V}$ or $V_{CC} = 5 \text{ V}$, and $T_A = 25^{\circ}\text{C}$.

NOTE 4: Test conditions are C1–C4 = 0.1 μ F at V_{CC} = 3.3 V ± 0.3 V; C1 = 0.047 μ F, C2–C4 = 0.33 μ F at V_{CC} = 5 V ± 0.5 V.



DRIVER SECTION

electrical characteristics over recommended ranges of supply voltage and operating free-air temperature (unless otherwise noted) (see Note 4 and Figure 5)

PARAMETER		TEST CONDITIO	MIN	TYP†	MAX	UNIT	
Vон	High-level output voltage	DOUT at R _L = $3 \text{ k}\Omega$ to GND,	DIN = GND	5	5.4		V
VOL	Low-level output voltage	DOUT at R _L = $3 \text{ k}\Omega$ to GND,	DIN = VCC	-5	-5.4		V
lн	High-level input current	VI = VCC			±0.01	±1	μΑ
IլL	Low-level input current	V _I at GND			±0.01	±1	μΑ
	Short-circuit output current [‡]	$V_{CC} = 3.6 \text{ V}, \qquad V_{O} = 0 \text{ V}$			105	-00	A
los		V _{CC} = 5.5 V,	VO = 0 V		±35	±60	mA
ro	Output resistance	V_{CC} , V+, and V- = 0 V,	V _O = ±2 V	300	10M		Ω
	Output leakers surrest	PWRDOWN = GND, V _{CC} = 3 V to 3.6 V	$V_0 = \pm 12 \text{ V},$			±25	4
l _{off}		PWRDOWN = GND, V _{CC} = 4.5 V to 5.5 V	$V_0 = \pm 10 \text{ V},$	±25		μΑ	

[†] All typical values are at $V_{CC} = 3.3 \text{ V}$ or $V_{CC} = 5 \text{ V}$, and $T_A = 25^{\circ}\text{C}$.

switching characteristics over recommended ranges of supply voltage and operating free-air temperature (unless otherwise noted) (see Note 4 and Figure 5)

	PARAMETER	TEST CONDITIONS			TYP [†]	MAX	UNIT
	Maximum data rate	C _L = 1000 pF, One DOUT switching,	$R_L = 3 kΩ$, See Figure 1	150	250		kbit/s
tsk(p)	Pulse skew§	C _L = 150 pF to 2500 pF, See Figure 2	$R_L = 3 \text{ k}\Omega \text{ to } 7 \text{ k}\Omega,$		300		ns
CD/tr\	Slew rate, transition region	$R_L = 3 k\Omega$ to $7 k\Omega$,	C _L = 150 pF to 1000 pF	6		30	\//uo
SR(tr)	(See Figure 1)	V _{CC} = 3.3 V	C _L = 150 pF to 2500 pF	4		30	V/μs

[†] All typical values are at $V_{CC} = 3.3 \text{ V}$ or $V_{CC} = 5 \text{ V}$, and $T_A = 25^{\circ}\text{C}$.

§ Pulse skew is defined as $|t_{PLH} - t_{PHL}|$ of each channel of the same device. NOTE 4: Test conditions are C1–C4 = 0.1 μ F at V_{CC} = 3.3 V ± 0.3 V; C1 = 0.047 μ F, C2–C4 = 0.33 μ F at V_{CC} = 5 V ± 0.5 V.



^{\$} Short-circuit durations should be controlled to prevent exceeding the device absolute power-dissipation ratings, and not more than one output should be shorted at a time.

NOTE 4: Test conditions are C1–C4 = 0.1 μ F at V_{CC} = 3.3 V ± 0.3 V; C1 = 0.047 μ F, C2–C4 = 0.33 μ F at V_{CC} = 5 V ± 0.5 V.

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RECEIVER SECTION

electrical characteristics over recommended ranges of supply voltage and operating free-air temperature (unless otherwise noted) (see Note 4 and Figure 5)

	PARAMETER	TEST CONDITIONS	MIN	TYP [†]	MAX	UNIT
Vон	High-level output voltage	I _{OH} = -1 mA	V _{CC} – 0.6 V	V _{CC} – 0.1 V		V
VOL	Low-level output voltage	I _{OL} = 1.6 mA			0.4	V
V _{IT+}	Decitive region in a state and college	V _{CC} = 3.3 V		1.5	2.4	V
	Positive-going input threshold voltage	V _{CC} = 5 V		1.8	2.4	V
\/	No notive point input threehold values	V _{CC} = 3.3 V	0.6	1.2		V
VIT-	Negative-going input threshold voltage	V _{CC} = 5 V	0.8	1.5		V
V _{hys}	Input hysteresis (V _{IT+} - V _{IT-})			0.3		V
l _{off}	Output leakage current	EN = V _{CC}		±0.05	±10	μΑ
rį	Input resistance	$V_{I} = \pm 3 \text{ V to } \pm 25 \text{ V}$	3	5	7	kΩ

† All typical values are at V_{CC} = 3.3 V or V_{CC} = 5 V, and T_A = 25°C. NOTE 4: Test conditions are C1–C4 = 0.1 μ F at V_{CC} = 3.3 V \pm 0.3 V; C1 = 0.047 μ F, C2–C4 = 0.33 μ F at V_{CC} = 5 V \pm 0.5 V.

switching characteristics over recommended ranges of supply voltage and operating free-air temperature (unless otherwise noted) (see Note 4)

	PARAMETER	TEST CONDITIONS	MIN TYPT	MAX	UNIT
tPLH	Propagation delay time, low- to high-level output	pation delay time, low- to high-level output $C_{L} = 150$ pF, See Figure 3			
tPHL	Propagation delay time, high- to low-level output	C _L = 150 pF, See Figure 3	300		ns
t _{en}	Output enable time	C_L = 150 pF, R_L = 3 kΩ, See Figure 4	200		ns
t _{dis}	Output disable time	C_L = 150 pF, R_L = 3 kΩ, See Figure 4	200		ns
t _{sk(p)}	Pulse skew [‡]	See Figure 3	300		ns

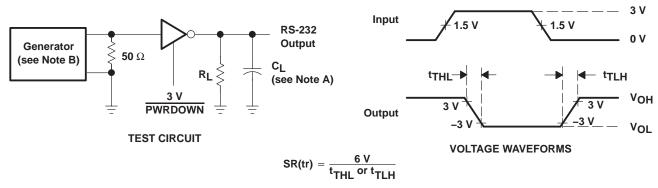
[†] All typical values are at $V_{CC} = 3.3 \text{ V}$ or $V_{CC} = 5 \text{ V}$, and $T_A = 25^{\circ}\text{C}$.

NOTE 4: Test conditions are C1–C4 = 0.1 μ F at V_{CC} = 3.3 V ± 0.3 V; C1 = 0.047 μ F, C2–C4 = 0.33 μ F at V_{CC} = 5 V ± 0.5 V.



[‡] Pulse skew is defined as |tplH - tpHL| of each channel of the same device.

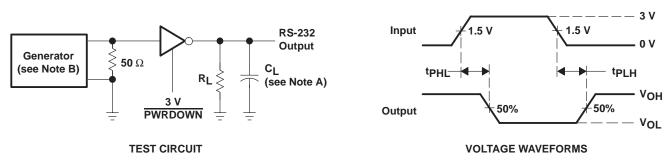
PARAMETER MEASUREMENT INFORMATION



NOTES: A. C_L includes probe and jig capacitance.

B. The pulse generator has the following characteristics: PRR = 250 kbit/s, $Z_O = 50~\Omega$, 50% duty cycle, $t_\Gamma \le 10$ ns. $t_f \le 10$ ns.

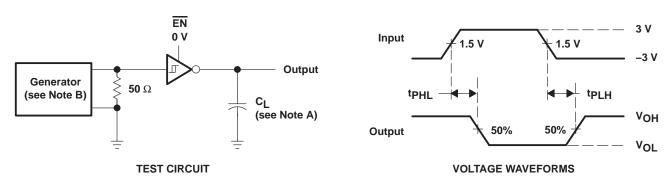
Figure 1. Driver Slew Rate



NOTES: A. C_L includes probe and jig capacitance.

B. The pulse generator has the following characteristics: PRR = 250 kbit/s, $Z_O = 50 \Omega$, 50% duty cycle, $t_f \le 10$ ns. $t_f \le 10$ ns.

Figure 2. Driver Pulse Skew



NOTES: A. C_L includes probe and jig capacitance.

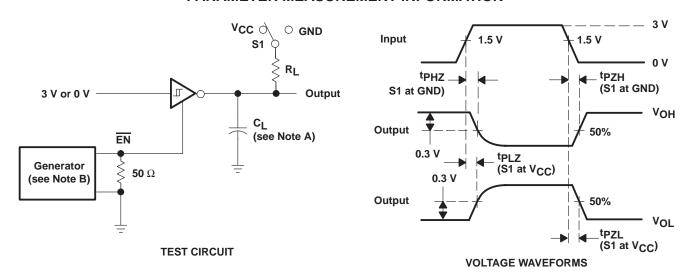
B. The pulse generator has the following characteristics: $Z_O = 50 \Omega$, 50% duty cycle, $t_r \le 10$ ns, $t_f \le 10$ ns.

Figure 3. Receiver Propagation Delay Times



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PARAMETER MEASUREMENT INFORMATION

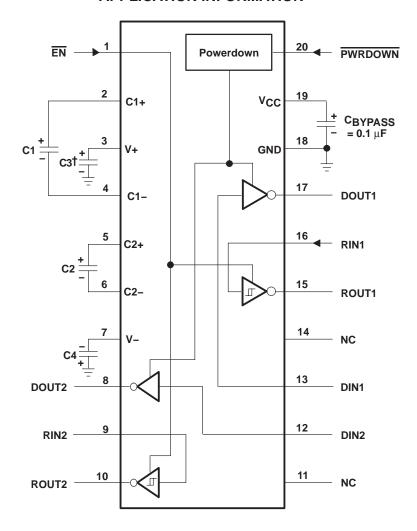


NOTES: A. C_L includes probe and jig capacitance.

B. The pulse generator has the following characteristics: $Z_0 = 50 \Omega$, 50% duty cycle, $t_r \le 10$ ns, $t_f \le 10$ ns.

Figure 4. Receiver Enable and Disable Times

APPLICATION INFORMATION



†C3 can be connected to VCC or GND.

NOTES: A. Resistor values shown are nominal.

- B. NC No internal connection
- C. Nonpolarized ceramic capacitors are acceptable. If polarized tantalum or electrolytic capacitors are used, they should be connected as shown.

V_{CC} vs CAPACITOR VALUES

VCC	C1	C2, C3, and C4
3.3 V \pm 0.3 V	0.1 μ F	0.1 μ F
5 V ± 0.5 V	0.047 μ F	0.33 μ F
3 V to 5.5 V	0.1 μF	0.47 μ F

Figure 5. Typical Operating Circuit and Capacitor Values





PACKAGING INFORMATION

Orderable Device	Status ⁽¹⁾	Package Type	Package Drawing	Pins	Package Qty	e Eco Plan ⁽²⁾	Lead/Ball Finish	MSL Peak Temp ⁽³⁾
MAX3222CDB	ACTIVE	SSOP	DB	20	70	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
MAX3222CDBE4	ACTIVE	SSOP	DB	20	70	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
MAX3222CDBG4	ACTIVE	SSOP	DB	20	70	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
MAX3222CDBR	ACTIVE	SSOP	DB	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
MAX3222CDBRE4	ACTIVE	SSOP	DB	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
MAX3222CDBRG4	ACTIVE	SSOP	DB	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
MAX3222CDW	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
MAX3222CDWE4	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
MAX3222CDWG4	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
MAX3222CDWR	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
MAX3222CDWRE4	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
MAX3222CDWRG4	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
MAX3222CPW	ACTIVE	TSSOP	PW	20	70	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
MAX3222CPWE4	ACTIVE	TSSOP	PW	20	70	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
MAX3222CPWG4	ACTIVE	TSSOP	PW	20	70	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
MAX3222CPWR	ACTIVE	TSSOP	PW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
MAX3222CPWRE4	ACTIVE	TSSOP	PW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
MAX3222CPWRG4	ACTIVE	TSSOP	PW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
MAX3222IDB	ACTIVE	SSOP	DB	20	70	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
MAX3222IDBE4	ACTIVE	SSOP	DB	20	70	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
MAX3222IDBG4	ACTIVE	SSOP	DB	20	70	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
MAX3222IDBR	ACTIVE	SSOP	DB	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
MAX3222IDBRE4	ACTIVE	SSOP	DB	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
MAX3222IDBRG4	ACTIVE	SSOP	DB	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
MAX3222IDW	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM





nm 18-Sep-2008

Orderable Device	Status ⁽¹⁾	Package Type	Package Drawing	Pins	Packag Qty	e Eco Plan ⁽²⁾	Lead/Ball Finish	n MSL Peak Temp ⁽³⁾
MAX3222IDWE4	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
MAX3222IDWG4	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
MAX3222IDWR	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
MAX3222IDWRE4	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
MAX3222IDWRG4	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
MAX3222IPW	ACTIVE	TSSOP	PW	20	70	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
MAX3222IPWE4	ACTIVE	TSSOP	PW	20	70	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
MAX3222IPWG4	ACTIVE	TSSOP	PW	20	70	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
MAX3222IPWR	ACTIVE	TSSOP	PW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
MAX3222IPWRE4	ACTIVE	TSSOP	PW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
MAX3222IPWRG4	ACTIVE	TSSOP	PW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM

(1) The marketing status values are defined as follows:

ACTIVE: Product device recommended for new designs.

LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

PREVIEW: Device has been announced but is not in production. Samples may or may not be available.

OBSOLETE: TI has discontinued the production of the device.

(2) Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check http://www.ti.com/productcontent for the latest availability information and additional product content details.

TBD: The Pb-Free/Green conversion plan has not been defined.

Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.

Pb-Free (RoHS Exempt): This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.

Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

(3) MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

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In no event shall TI's liability arising out of such information exceed the total purchase price of the TI part(s) at issue in this document sold by TI to Customer on an annual basis.

PACKAGE MATERIALS INFORMATION

www.ti.com 5-May-2011

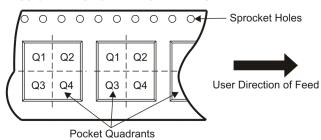
TAPE AND REEL INFORMATION





		Dimension designed to accommodate the component width
		Dimension designed to accommodate the component length
	K0	Dimension designed to accommodate the component thickness
		Overall width of the carrier tape
Γ	P1	Pitch between successive cavity centers

QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



*All dimensions are nominal

Device	Package Type	Package Drawing		SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
MAX3222CDBR	SSOP	DB	20	2000	330.0	16.4	8.2	7.5	2.5	12.0	16.0	Q1
MAX3222CDWR	SOIC	DW	20	2000	330.0	24.4	10.8	13.0	2.7	12.0	24.0	Q1
MAX3222CPWR	TSSOP	PW	20	2000	330.0	16.4	6.95	7.1	1.6	8.0	16.0	Q1
MAX3222IDBR	SSOP	DB	20	2000	330.0	16.4	8.2	7.5	2.5	12.0	16.0	Q1
MAX3222IDWR	SOIC	DW	20	2000	330.0	24.4	10.8	13.0	2.7	12.0	24.0	Q1
MAX3222IPWR	TSSOP	PW	20	2000	330.0	16.4	6.95	7.1	1.6	8.0	16.0	Q1

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*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
MAX3222CDBR	SSOP	DB	20	2000	346.0	346.0	33.0
MAX3222CDWR	SOIC	DW	20	2000	346.0	346.0	41.0
MAX3222CPWR	TSSOP	PW	20	2000	346.0	346.0	33.0
MAX3222IDBR	SSOP	DB	20	2000	346.0	346.0	33.0
MAX3222IDWR	SOIC	DW	20	2000	346.0	346.0	41.0
MAX3222IPWR	TSSOP	PW	20	2000	346.0	346.0	33.0

DW (R-PDSO-G20)

PLASTIC SMALL OUTLINE



NOTES: A. All linear dimensions are in inches (millimeters). Dimensioning and tolerancing per ASME Y14.5M-1994.

- B. This drawing is subject to change without notice.
- C. Body dimensions do not include mold flash or protrusion not to exceed 0.006 (0,15).
- D. Falls within JEDEC MS-013 variation AC.



DW (R-PDSO-G20)

PLASTIC SMALL OUTLINE



NOTES:

- A. All linear dimensions are in millimeters.
- B. This drawing is subject to change without notice.
- C. Refer to IPC7351 for alternate board design.
- D. Laser cutting apertures with trapezoidal walls and also rounding corners will offer better paste release. Customers should contact their board assembly site for stencil design recommendations. Refer to IPC—7525
- E. Customers should contact their board fabrication site for solder mask tolerances between and around signal pads.



PW (R-PDSO-G20)

PLASTIC SMALL OUTLINE



NOTES:

- A. All linear dimensions are in millimeters. Dimensioning and tolerancing per ASME Y14.5M—1994.
- B. This drawing is subject to change without notice.
- Body length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0,15 each side.
- Body width does not include interlead flash. Interlead flash shall not exceed 0,25 each side.
- E. Falls within JEDEC MO-153



DB (R-PDSO-G**)

PLASTIC SMALL-OUTLINE

28 PINS SHOWN



NOTES: A. All linear dimensions are in millimeters.

B. This drawing is subject to change without notice.

C. Body dimensions do not include mold flash or protrusion not to exceed 0,15.

D. Falls within JEDEC MO-150

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